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# Intellectual Capital and Transforming Business Banking

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## A B S T R A C T

The purpose of this study is to examine the effect of intellectual capital on the financial performance of banking companies in Indonesia. Intellectual capital in this case is measured by value added capital employed (VACA), value added human capital (VAHU), and structural capital value added (STVA). The target population in this study are banking companies listed on the Indonesia Stock Exchange with the observation period 2018-2020. The data obtained amounted to 122 and were analyzed using multiple linear regression analysis methods. Simultaneously, intellectual capital variables affect the financial performance of banking companies, which means that the better the company's intellectual capital, the company's performance will also increase. However, partially only value added human capital (VAHU) and structural capital value added (STVA) affect financial performance. The implication of the results shows that the added value of the banking company's budget funds for its employees contributes to improving financial performance. The results also show that banking companies that can manage structural capital well, such as the utilization of technology, information systems, infrastructure, corporate culture and other things whose value is higher than the value of materials efficiently, will be able to improve their financial performance. Previous research only observed companies that experienced profits, while in this study observations were also made of companies that experienced losses during the observation period.

## 1.   INTRODUCTION

The rapid development of technology has encouraged the emergence of new innovative and efficient business models. (Miftah et al., 2021). Business competition in the banking sector also requires innovation to succeed. In recent years, there has been a lot of consolidation in the banking sector. The number of commercial banks has decreased from year to year due to acquisitions and mergers of banks. Based on **Figure 1** in 2018, the number of commercial banks was recorded at 115 banks, then at the end of 2020, it amounted to 109 (Indonesian banking statistic, 2020). This is also made possible by the regulation issued by the Financial Services Authority (OJK) where consolidation is expected to create strong banks.  Banking is a financial institution that has an important role in the development and economic growth of a country (Marwansyah et al., 2018). Banks that expand their business scale and increase competitiveness through innovation capabilities can make a significant contribution to the national economy (Michelle, 2021). Contrary to this consolidation, the banking sector's return on asset (ROA) performance has decreased can be seen in **Figure 2**. ROA is one of the scales of bank health (Suhendar et al., 2014). The cause of the decline in ROA is the high Average Banking Operational Efficiency Ratio (ABOER) (Hartini, 2016). This parameter measures the level of the company in carrying out operational activities efficiently (Kasmir, 2014).   The problem is whether consolidation through bank mergers has succeeded in building competitive advantage and long-term sustainability in the banking business.  In this case, intellectual capital is seen as a driver of company performance. Companies with prospective resources will have a competitive advantage and may eventually perform better in the long run.
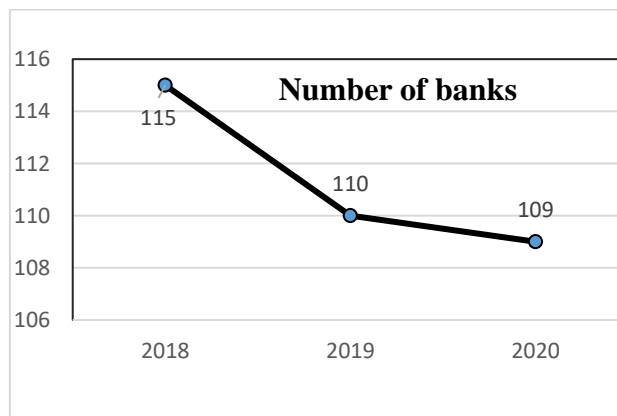


Source: Indonesian banking statistic Vol.19 Number 13 December 2020
**Figure 1.** Growth Chart of The Number of Indonesian Commercial Banks In 2018-2020
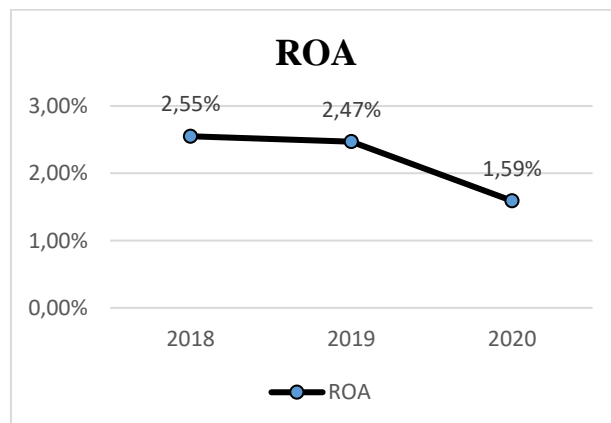


Source: Indonesian banking statistic Vol.19 Number 13 December 2020
**Figure 2.** Graph of average banking ROA in Indonesia 2018-2020

Following the theory of dynamic capabilities, effective resource management is not enough for a firm to succeed; additional functionally specific competencies are required. The role of a firm's capabilities, which are developed through complex interactions with resources and enable the firm to use its available resources in combination with the unique information and organizational processes, is attributed to resources rather than resources themselves as the source of a firm's sustainable competitive advantages (Radjenovic & Krstic, 2017). Businesspeople began to change the paradigm that the ability to compete not only lies in tangible assets owned by the company but also lies in intangible assets (Nurhayati et al., 2019).

Several previous studies have shown that intellectual capital is a determining factor in the financial performance of companies (Acuña-Opazo, C. and González, 2021), (Kasoga, 2020), (Poh et al., 2018), (García Castro et al., 2021), (Le & Nguyen, 2020), (Xu & Wang, 2018) and (Ousama et al., 2020).

This study refers to previous research conducted by (Kasoga, 2020), (Poh et al., 2018), (Xu & Wang, 2018), (Ousama et al., 2020) and (Siregar & Fajrillah, 2020). The difference in research lies in the object of research, the research period, and the sampling criteria in this study including all banking companies that experienced losses or profits, while in the previous study, only companies experienced profits.

Based on the phenomenon and previous research which showed different results, this study intends to re-examine the effect of intellectual capital on financial performance. This study aims to provide empirical evidence that intellectual capital intangible assets are important factors in improving financial performance. Accounting standards are still more focused on measuring and reporting fixed assets rather than intangible assets. Therefore, this research can contribute to the need to consider the development of better accounting standards in recognizing and measuring intangible assets, including intellectual capital.

## 2. METHODS

This study employs a quantitative research methodology with a target population of banking companies listed on the Indonesia Stock Exchange between 2018 and 2020. The data used in this study are secondary data obtained from the annual financial statements with criteria: banking companies registered on the Indonesia Stock Exchange for the period 2018-2020; the company publishes its annual financial statements during the period 2018-2020; and all data related to the measurement of variables are available in the company's financial statements. This study's methodology relies on work by (Siregar & Fajrillah, 2020) and (Poh et al., 2018), which used multiple linear regression analysis to investigate the impact of intellectual capital on financial performance.

Based on the observations, 122 data were obtained which were then analyzed using the multiple linear regression method. This research is a causality test. Variable measurement scale uses a ratio scale. Causality research with variable indicators using a ratio scale according to (Josep F. Hair Jr, 2010) is very suitable for analysis using multiple regression analysis. Financial performance in this study is measured using return on assets (ROA). Meanwhile, intellectual capital is measured using the theory put forward by (Pulic, 1998). Because the excellence of intellectual capital, which is part of a company's intangible assets, is difficult to recognize, (Pulic, 1998) improved the indirect measurement of Intellectual Capital by using the measurement of Value-Added Intellectual Coefficient (VACA-value-added capital employed), human capital (VAHU-value-added human capital), and structural capital (STVA-value-added structural capital). Hypothesis testing using F-test, t-test, and coefficient of determination test (R2). The research equation model tested in this study:

$$ROA = \alpha + \beta_1 VACA + \beta_2 VAHU + \beta_3 STVA + \varepsilon$$

ROA          = Return on Asset
$\beta_1 - \beta_3$       = Regression Coefficient
VACA        = Value Added Capital Employed
VAHU        = Value added human capital
STVA        = Structural Capital Value Added
$\varepsilon$              = Error

The definition and measurement of variables can be seen in **Table 1**.

**Table 1**. Identification and Measurement of Variables

| Variables | Formulas | Scale |
|---|---|---|
| Financial Performance (ROA) | $ROA = \dfrac{\text{Earning after tax}}{\text{Total Assets}}$ | Ratio |
| Value Added Capital Employed (VACA) | $VACA = \dfrac{\text{Value Added}}{\text{Capital Employed}}$ | Ratio |
| Value Added Human Capital (VAHU) | $VAHU = \dfrac{\text{Value Added}}{\text{Human Capital}}$ | Ratio |
| Structural Capital Value Added (STVA) | $STVA = \dfrac{\text{Structural Capital}}{\text{Value Added}}$ | Ratio |
| | $\text{Structural Capital} = \dfrac{VA}{HC}$ | |

Source: developed for this research (2022)

## 3. RESULTS AND DISCUSSION
### 3.1. Descriptive Statistical Analysis

**Table 2** shows that the average value-added capital employed (VACA) is 0.1385, the average value-added human capital (VAHU) is 1.4401, and the average structural capital value added (STVA) is 0.3540. The minimum value of value-added capital employed (VACA) is      -0.2563 which indicates the lack of management's ability to manage capital employed consisting of physical capital and financial capital to create value added for the company. The maximum value of value-added capital employed (VACA) is 0.3492 which shows that the bank has created value added by managing capital employed not optimal.

Then the minimum value of value added human capital (VAHU) is -2.4880 and the maximum value is 2.9529, with an average value greater than the standard deviation, which indicates that the bank has been able to manage human capital well. Meanwhile, the minimum value of structural capital value added (STVA) is -7.4083 where the maximum value is 9.9457. An average value smaller than the standard deviation indicates that there is a high difference between each bank in managing the capital structure to create value added for the company.

**Table 2**. Descriptive Statical Analysis

|  | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| X1_VACA | 122 | -,2563 | ,3492 | ,138527 | ,1034241 |
| X2_VAHU | 122 | -2,4880 | 2,9520 | 1,440198 | ,9299302 |
| X3_STVA | 122 | -7,4083 | 9,9457 | ,354062 | 1,5607643 |
| Y_R0A | 122 | -9,23 | 2,68 | ,3167 | 1,90006 |
| Valid N (listwise) | 122 |  |  |  |  |

Source: output of SPSS for this research (2022)

Data must be distributed normally in good regression models. The One Sample Kolmogorov Smirnov Non-Parametric Test, as indicated in **Table 3**, is used in this study's normality assessment.

**Table 3**. One Sample Kolmogorov Smirnov Non-Parametric Test

|  |  | Unstandardized Residual |
|---|---|---|
|  |  | 122 |
| Normal Parameters[a,b] | Mean | ,0000000 |
|  | Std. Deviation | ,35820479 |
| Most Extreme Differences | Absolute | ,049 |
|  | Positive | ,049 |
|  | Negative | -,049 |
| Test Statistic |  | ,049 |
| Asymp. Sig. (2-tailed) |  | ,200[c,d] |

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

d. This is a lower bound of the true significance.

Source: output of SPSS for this research (2022)

The probability value or Asymp. Sig. (2-tailed) the regression equation is 0.200 according to the Kolmogorov-Smirnov test displayed in Table 3, which indicates that the probability value is greater than 0.05 or 0.200>0.05, indicating that the residual data is normally distributed.

A suitable regression model should not correlate with its independent variables. If the tolerance value is greater than 0.1 and the VIF value is greater than 10, the regression model is not multicollinear (Ghozali, 2016). **Table 4** illustrates the findings of the multicollinearity test.

**Table 4**. Multicollinearity Test

| | | **Coefficients[a]** | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Unstandardized Coefficients | | Standardized Coefficients | | | Collinearity Statistics | |
| | Model | B | Std. Error | Beta | t | Sig. | Tolerance | VIF |
| 1 | (Constant) | 2,069 | ,184 | | 11,258 | ,000 | | |
| | X1_VACA | 1,589 | 1,455 | ,086 | 1,092 | ,277 | ,422 | 2,367 |
| | X2_VAHU | 1,536 | ,162 | ,752 | 9,509 | ,000 | ,424 | 2,359 |
| | X3_STVA | -,130 | ,063 | -,107 | -2,067 | ,041 | ,995 | 1,005 |

a. Dependent Variable: Y_R0A

Source: output of SPSS for this research (2022)

According to **Table 4**, the tolerance value for the three independent variables in this study is greater than 0.1, and the VIF is greater than 10. Ultimately, there is no multicollinearity between the independent variables in the regression model.

In a linear regression model, the autocorrelation test is used to determine whether there is a relationship between confounding error in period t and confounding error in period t-1. The regression model is good if it is free from autocorrelation with the criteria for the value du < d < 4-du (Ghozali, 2016). The autocorrelation test on the regression model in this investigation yielded the results shown in **Table 5**.

**Table 5**. Autocorrelation test

Model Summaryb

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|---|---|---|---|---|---|
| 1 | ,829a | ,687 | ,680 | 1,07561 | 2,188 |

a. Predictors: (Constant), X3_STVA, X2_VAHU, X1_VACA

b. Dependent Variable: Y_R0A

Source: output of SPSS for this research (2022)

Based on **Table 5**, the Durbin-Watson (d) value is 2.188. This result will be compared with the value in the Durbin-Watson table with a significance level of 5%, with a total of 122 n, and 3 independent variables (k = 3). Based on the Durbin-Watson table, the upper limit value (du) is 1.7552 and the lower limit value (dl) is 1.6545. Therefore, in the regression model of this study there is no positive or negative autocorrelation.

The heteroscedasticity test determines whether there is a variance discrepancy between the residuals of one observation and another in the regression model (Ghozali, 2016). The heteroscedasticity test was determined in this study by evaluating the scatterplot diagram. There is no heteroscedasticity if there is no pattern on the scatterplot and the points are spread above and below 0 on the Y axis. **Figure 3** depicts a scatterplot diagram based on research data.
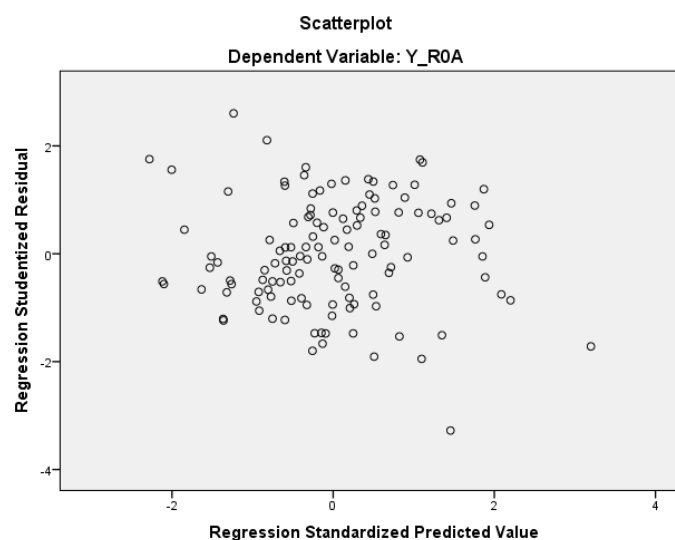


**Figure 3**. Scatterplot Diagram

The scatterplot diagram in Figure 3 illustrates that there is no discernible pattern in the image since the dots on the Y axis are distributed randomly both above and below zero. As a result, heteroscedasticity does not arise in this study's regression model.

### 3.2. Hypothesis Test

The company needs outstanding intellectual capital to support improved performance and sustainable development (Agustia et al., 2021). Therefore, long-term value and intellectual capital are related ideas (Alvino et al., 2021). The Intellectual Capital (IC) component consists of three elements, namely human capital, structural capital, and relational capital or customer capital. Human capital is an organization's individual knowledge stock that is responded to by its personnel (Febriany, 2019). Non-human knowledge in the firm, such as corporate culture, computer software, information technology, and other things that exceed the company's material value, is referred to as structural capital. Customer capital is related to customer loyalty, service to consumers, and good relations with suppliers. In this research, financial performance is measured using return on assets (ROA). Meanwhile, intellectual capital is measured using the theory put forward by (Pulic, 1998) which consists variabels capital employed (VACA-value-added capital employed), human capital (VAHU-value-added human capital), and structural capital (STVA-value-added structural capital).

Based on the output of SPSS which is shown in table 6, the value of the F-test is 86.527 >2.68 and the value of the significance is 0.000 < 0.05. These results proved that VACA, VAHU, and STVA influence ROA simultaneously.

**Table 6**. F-test result

ANOVA[a]

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 300,318 | 3 | 100,106 | 86,527 | ,000[b] |
| | Residual | 136,518 | 118 | 1,157 | | |
| | Total | 436,835 | 121 | | | |

a. Dependent Variable: Y_R0A
b. Predictors: (Constant), X3_STVA, X2_VAHU, X1_VACA

According to the SPSS result in **Table 7**, the significant value of VACA is 0.277, which is greater than 0.05. These findings explain why the use of value-added capital does not affect financial performance as measured by return on assets. Meanwhile, VAHU has a significant value of 0.00, which is less than 0.05, indicating that value-added human capital influences financial performance as measured by return on assets. Furthermore, the significant value of STVA is 0.041 which is smaller than 0.05, which explained that structural capital value added affects financial performance as evaluated by return on assets.

**Table 7**. t-test result

Coefficients[a]

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 2,069 | ,184 | | 11,258 | ,000 |
| | X1_VACA | 1,589 | 1,455 | ,086 | 1,092 | ,277 |
| | X2_VAHU | 1,536 | ,162 | ,752 | 9,509 | ,000 |
| | X3_STVA | -,130 | ,063 | -,107 | -2,067 | ,041 |

a. Dependent Variable: Y_R0A

### 3.3. Coefficient of Determination (R2) Test

Test coefficient of determination in this study using the value of Adjusted R Square (R2). Table 8 shows that the value of adjusted R2 is 0.680, which means that 68.0% growth in ROA is

influenced by the independent variables used in the equation model in this study, namely VACA, VAHU, and STVA, while the remaining 32.0% is influenced by factors not included in the regression equation.

Table 8. Test result coefficient of determination ($R^2$)

| | | | Model Summary[b] | | |
|---|---|---|---|---|---|
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
| 1 | ,829[a] | ,687 | ,680 | 1,07561 | 2,188 |

a. Predictors: (Constant), X3_STVA, X2_VAHU, X1_VACA

b. Dependent Variable: Y_R0A

### 3.4. The influence of value-added capital employed, value added human capital, and structural capital value added on financial performance

According to research findings in **Table 7**, the value added capital employed (VACA), value added human capital (VAHU), and structural capital value added (STVA) have a simultaneous impact on financial performance. Results indicated that the greater the value-added capital employed (VACA) and value added human capital (VAHU) owned by the company, the company will increasingly have the opportunity to get value added to improve return on asset (ROA). The study's findings are consistent with the dynamic capability theory, according to which a corporation can gain a lasting competitive advantage by combining its capabilities with distinctive information, organizational processes, and resources (Radjenovic & Krstic, 2017). These findings indicate that banking companies listed on the Indonesian stock exchange have utilized human capital to generate profits for the company. Banking companies have also been able to fulfill routine processes and good capital employed in supporting employee efforts to produce optimal performance.

This result is consistent with Febriany (2019); (Kasoga, 2020); (Poh et al., 2018); (Xu & Wang, 2018); (Ousama et al., 2020); and (Siregar & Fajrillah, 2020) which discovered a substantial correlation between intellectual capital as evaluated by the value-added intellectual capital technique and financial performance. The results of this study are consistent with (Ulum et al., 2008) research where the average value of VAIC in banking companies listed on the Indonesia Stock Exchange (BEI) in 2018-2020 is in the Good Performers category, which means that banks have begun to be able to manage the company's intellectual capital well.

Research by Weqar et al. (2020) discovered that intellectual capital improves the financial performance of Indian enterprises listed on the Standard and Poor's Bombay Stock Exchange Sensitive Index. (Safitri & Riduwan, 2019) discovered that VACA improves the company's financial performance, which is consistent with the findings of Siregar & Fajrillah (2020) study. According to Irawan & Silangit, (2018), the ability of employees to generate greater value for the firm with the money spent on labor is referred to as human capital. The greater added value provided for every rupiah invested demonstrates that the company has effectively managed its human resources to develop excellent employees, which will contribute to the business's financial performance. According to Senjaya & Suzan (2021), VAHU has a positive and significant impact on financial performance.

According to research findings in **Table 7**, Structural capital value added (STVA) has a negative effect on return on assets. This shows that the higher the value of structural capital value added (STVA), the smaller the return on assets (ROA). This result shows that structural capital, which includes all knowledge in the company that is not in human capital, such as databases, strategies, and things that have a higher value than material value, does not provide

added value and burdens the company so that return on assets decreases. This result is inconsistent with dynamic capability theory, which should allow companies to gain a competitive advantage as structural capital value added increases.

Theoretically, structural capital works together with human capital to improve firm performance. Structural capital efficiency (SCVA) is a metric that measures structural capital. The amount of structural capital required to generate one dollar of value added (VA) is measured as structural capital efficiency (SCVA), and it shows how successful structural capital is in creating value. Value added (VA) minus human capital (VAHU) is used to calculate structural capital. Value added (VA) is the result of sales (total revenue) minus total costs. Structural capital value added (STVA) measures how much structural capital is needed to produce value added (VA) efficiently. This indicates that the company has not been able to complete the usual operations and structures efficiently. Therefore, asset management, especially for banks that experience losses, must be managed better so that it is expected to increase the return on assets.

This is not in line with previous studies which show the results that structural capital value added will improve company performance. However, this study is in line with the research of Usman & Mustafa (2019) that intellectual capital has no impact on financial performance. These results are also consistent with the research of Chowdhury et al. (2018) which proves that there is no significant positive relationship between Efficiency Intellectual Capital (VAIC) and financial performance in textile companies in Bangladesh.

### 3.5. The influence of value-added capital employed on financial performance

Partially, the value-added capital employed (VACA) does not affect financial performance as measured by return on assets. The results of this study indicate that banking companies have not been able to utilize employed capital consisting of physical capital and financial capital and create value-added from total equity. The results of this study indicate that banking companies have not been able to utilize working capital consisting of physical capital and financial capital and create added value from total equity. Some profitable banks have a high level of operational efficiency, which allows them to generate sizable profits despite the relatively small capital employed. Thus, even though "value added capital employed" is low, good operational efficiency can compensate and affect ROA positively. This condition is certainly different from banks that record losses. In some banks, ROA is not affected by the amount of capital employed. In this case, the profit generated by the invested capital is not significant in influencing ROA. It is also possible that some banks have not provided the best service to customers. Less responsive services will reduce customer satisfaction and reduce customer confidence in the bank so profits are reduced and financial performance will also decline. This is not in line with Pulic's statement that to determine the value of intellectual capital is also formed from employed capital, not only looking at human capital and structural capital. These results do not support research findings conducted by (Kasoga, 2020), (Poh et al., 2018), (Xu & Wang, 2018), (Ousama et al., 2020) Weqar et al. (2020) and Senjaya & Suzan (2021) which state that VACA affects financial performance, but support the finding of research conducted by Chowdhury et al. (2018).

### 3.6. The influence of value-added human capital on financial performance

According to research findings, value-added human capital (VAHU) influences the return on asset (ROA). The higher the value of value-added human capital (VAHU), the higher the financial performance of the company. The results of this study indicate that the contribution made by human resources in creating value added, through improved service quality, smart investment decisions, effective risk management, innovation and operational efficiency increases the

reputation and customer trust. Qualified human resources can improve the quality of services provided to customers. This will have a positive impact on return on assets (ROA) by increasing revenue and reducing the risk of losing customers. Qualified resources can analyze market conditions, assess investment risks, and manage the bank's asset portfolio well. The right decisions in terms of investment and risk management can help increase revenue, reduce the risk of loss, and ultimately affect ROA. In addition, competent human resources are instrumental in driving innovation and operational efficiency within the bank. They can help build the bank's good reputation and increase customer confidence which in turn will have a positive impact on the bank's ROA.

Human capital is the most important component contained in intellectual capital (Febriany, 2019). Human capital is related to the wealth of a company that is assessed from its human resources. These results support research findings conducted by (Poh et al., 2018), (Xu & Wang, 2018), (Ousama et al., 2020) Weqar et al. (2020) Siregar & Fajrillah (2020) and Safitri & Riduwan (2019), that human capital has a significant influence on financial performance. The strategy carried out by banks to increase value added human capital (VAHU) is through employee development and training programs. Employee development and training include technical training, financial market understanding, risk management, communication and leadership skills. In addition, the existence of fair compensation and incentive policies, organizational culture and effective performance management also contribute to the increase in value added human capital.

### 3.7. The influence of structural capital value added on financial performance

Based on research results, Structural capital value added (STVA) has a negative effect on return on assets. This shows that the higher the value of structural capital value added (STVA), the smaller the return on assets (ROA). Banks should effectively manage structural capital, such as technology, information systems, infrastructure, corporate culture, and other assets whose value exceeds their monetary value. Structural capital is a means to assist human capital in improving company performance. However, in this study, an increase in structural capital has a negative effect on bank performance.

The cause of this condition is the declining operational efficiency. Despite the increase in structural capital value added, the bank's operating efficiency declined as operating costs increased disproportionately to the increase in revenue. For some banks that posted losses, overhead costs increased significantly without a corresponding increase in revenue. As a result return on assets (ROA) may decline despite an increase in structural capital value added. Banks should have managed structural capital effectively. Increased value added structural capital may mean greater business expansion or diversification such as technology, information systems, infrastructure, corporate culture, and other assets whose value exceeds their monetary value. However, if the expansion or diversification carries significant risks and is not managed properly, the bank may experience an increase in credit risk, market risk, or operational risk. Increased risk can negatively affect ROA. In addition, external factors such as interest rates, economic conditions and industry competition during the observation period can also affect the overall financial performance of the bank. Therefore, the bank's ROA may decrease despite an increase in structural capital value added. This study is in line with the research of Usman & Mustafa (2019) that intellectual capital has no impact on financial performance. These results are also consistent with the research of Chowdhury et al. (2018) which proves that there is no significant positive relationship between Efficiency Intellectual Capital (VAIC) and financial performance.

### 4. CONCLUSION

This study found that value added intellectual capital characteristics had an impact on financial performance. This finding indicates that the higher the company's intellectual capital, the higher the company's performance. The findings also revealed that the value-added capital employed has no effect on financial performance, however the value-added human capital and structural capital influence financial performance. The results indicate that companies cannot manage the utilization of intellectual capital from capital employed which consists of physical capital and financial capital and create value added from total equity efficiently to improve the company's financial performance. This result shows that structural capital, which includes all knowledge in the company that is not in human capital, such as databases, strategies, and things that have a higher value than material value, does not provide added value and burdens the company so that return on assets decreases. This research is expected to contribute to the development of further researchers, by observing various types of company sectors. Further research is also expected to extend the observation period and analyze other variables that can affect financial performance, such as firm value and corporate governance.

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